

# Guidance for Inspecting Closed, Illegal, and Abandoned Disposal Sites for State Minimum Standards



## DRAFT

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# Contents

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<b>1. Introduction .....</b>	<b>3</b>
1.1. Purpose of the Guidance.....	
1.2. Regulatory Authority .....	
1.3. Investigation and Enforcement Assistance.....	
<b>2. Gas Standard.....</b>	<b>4</b>
2.1. Compliance with Gas Standard .....	
2.2. Factors to Consider in Determining Violation .....	
<b>3. Cover Standard .....</b>	<b>7</b>
3.1. Compliance with Cover Standard .....	
3.2. Factors to Consider in Determining Violation .....	
<b>4. Drainage Standard .....</b>	<b>9</b>
4.1. Compliance with the Drainage Standard .....	
4.2. Factors to Consider in Determining a Violation .....	
<b>5. Erosion Standard.....</b>	<b>10</b>
5.1. Compliance with the Erosion Standard .....	
5.2. Factors to Consider in Determining a Violation .....	
<b>6. Security Standard .....</b>	<b>11</b>
6.1. Compliance with the Security Standard .....	
6.2. Factors to Consider in Determining a Violation .....	

# 1. Introduction

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The inspection responsibility of Local Enforcement Agency's at Closed, Illegal and Abandoned Sites is critical to the protection of Public Health and Safety and the Environment. Unlike permitted landfill facilities, which have the financial resources to correct non-compliant operating and closure requirements, CIA sites generally have little or no resources to correct deficiencies related to state minimum standards. Most CIA sites are owned by private parties that "inherited" municipal legacy disposal sites, which had minimal (if any) requirements at the time the site ceased accepting waste. Local Developers seeking to utilize CIA sites can be required to stabilize (consolidate, cap, vegetate, perform gas monitoring and control) or clean-close CIA sites as a requirement for development (the costs for which the developer will try to absorb into the overall project costs). The LEAs should not rely on the development of a CIA site to obtain compliance as it should be noted that in many cases the cost of remediation may be prohibitive to the development of site (especially if clean-closure is required) and the presence of a CIA site will generate institutional controls, land-use restrictions, deed restrictions and postclosure care of the CIA site (all of which will incur a cost to the responsible party).

Inspection, documentation and tracking of site conditions of Closed, Illegal and Abandoned Disposal Sites are key tasks performed by Local Enforcement Agencies to ensure that CIA sites do not pose a threat to public health and safety and the environment. This task of inspecting CIA sites can be burdensome without objective guidance on determining what "compliance" or non-compliance is with respect to a general set of standards.

The standards for which CIA sites must comply with to protect public health and safety and the environment are relatively straight forward in terms of major areas: Gas monitoring and Control, Cover, Drainage, Erosion and Security measures. The areas themselves, however, lend themselves to much interpretation, typically based on an inspectors level of knowledge of both the regulations and field experience in reviewing various site conditions and determining magnitude of correction required. If a minor level of resources are required to correct a deficiency (under \$1000) it is generally not a violation, e.g. removal of a small amount of litter or illegally disposed of waste, putting up a sign, etc. Violations should typically be used to bring about a more resource-intensive capital improvement, such as the installation of a gas monitoring network, installation of gas controls, installation of drainage controls, slope reconfigurations, erosion matting and seeding, installation of fencing and gates, etc. The Solid Waste Clean-up Program (SWCP) can only perform remediation at sites where the Responsible Party is unable or unwilling to perform remediations in a timely manner. In moving remedies forward to the SWCP, enforcement of a particular standard must be documented and the RP provided an opportunity to correct the deficiency.

This guide has been established to assist in facilitating the process of bringing the collective knowledge and experience of LEAs, RWQCB and IWMB staff to "objectifying" the process of evaluating compliance of CIA sites with state minimum standards.

The California Integrated Waste Management Board (CIWMB) Closed, Illegal and Abandoned Site (CIA) program assists Local Enforcement Agencies in investigating and enforcing state minimum standards at CIA sites. As necessary, the CIA program can, at the request of the LEA conduct office and field investigations to obtain data and documentation upon which quantify site conditions with respect to state minimum standards and provide the necessary information to take enforcement actions and potential remediation by the IWMB Solid Waste Cleanup Program (AB 2136).

Statutory authority for investigating solid waste disposal sites is in California Public Resources Code (PRC) Section 45013, et seq.

## 2. Gas Standard

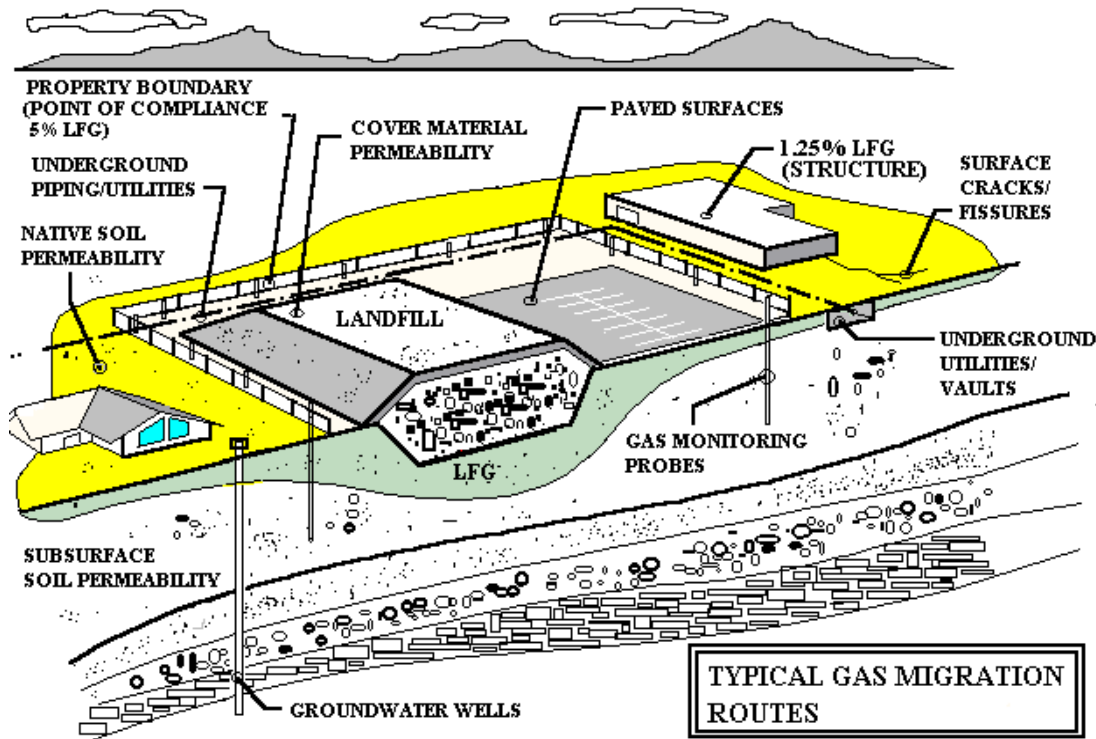


Figure 1. Typical Gas Migration Routes from a Disposal Site

### What would be considered a compliant site with the gas standards?

For a site that received unburned MSW (1950-present) which has indications of differential settlement and where gas generation is typical of local climatic and hydrologic conditions (or if Air SWAT was performed and indicated gas was present):

- 1) An adequate (and LEA approved) gas monitoring network is in place (27 CCR specified monitoring probes, probes consider structures, receptors, geology, etc.). SWAT probe data is suspect (Figure 2) since the methodology for placing SWAT probes was to drive a 6-ft long steel pipe containing a small sampling hole in it's tip into the ground. An acceptable gas monitoring probe (Figure 3) is a multi-depth probe placed in native soil adjacent to fill areas, bored to the depth of the landfill, completed using the maximum amount of screen possible, sealed between probe depths with a minimum two foot bentonite seal, annular spaced packed with 3/8 inch pea gravel and finished with labcock valves with labeling tags and a traffic-rated locking vault.
- 2) Historical documentation of gas monitoring data is available (monthly or quarterly frequency for minimum 2 yr period)
- 3) Gas controls have been implemented where monitoring probes have exceeded 5% at boundary or 1.25% in structures (gas extraction system, perimeter barrier trench, gas alarms for structures, etc.)

Figure 2. Air SWAT Probe shown relative to 27 CCR Probe

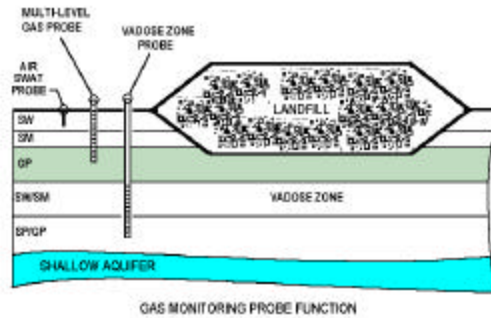
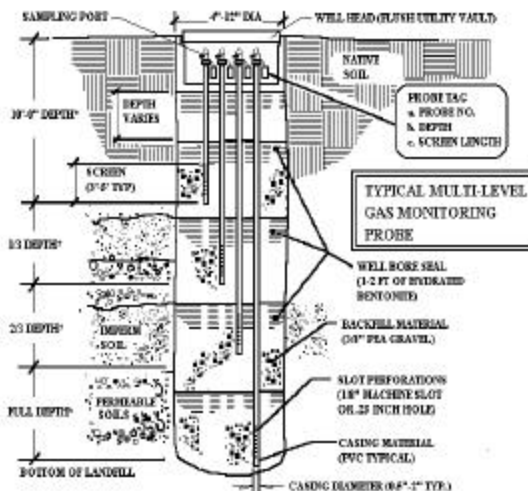


Figure 3. 27 CCR Gas Monitoring Probe Construction



### What factors would be considered in issuing a gas violation?

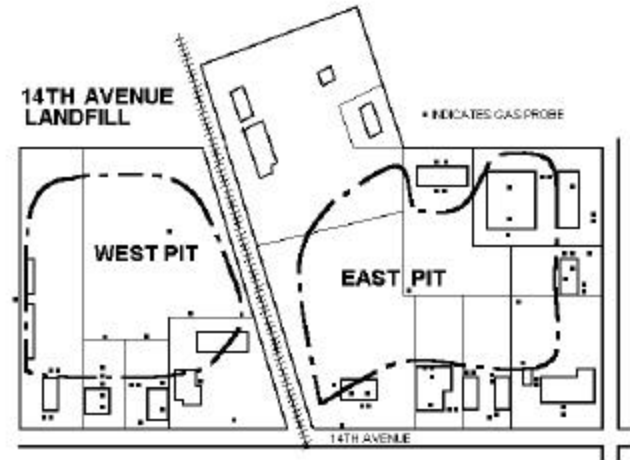
- ☐ Has the RP contracted with an environmental consultant to perform investigation and monitoring?
- ☐ Does the RP have qualified internal resources to perform investigation and monitoring (public works, etc.)?
- ☐ Has an Air SWAT been performed (did lab analysis results indicate 10% or higher methane in internal landfill gas samples?)
- ☐ Is an adequate monitoring network in place (multi-depth probes, minimum 1000 ft spacing, probes between fill and structures)?
- ☐ Has adequate sampling been performed and documented (monthly monitoring for a one year period or quarterly monitoring for a two year period)?
- ☐ Do gas levels exceed 5% at the property boundary or 1.25% in structures based on monitoring data?

- ❑ Are inhabitable structures on top of or near the landfill?
- ❑ Were structures constructed on "raised foundations", e.g. crawl space?
- ❑ Are the waste extents adequately defined to determine if structures are on or within 1000 ft?

**Figure 4. Aerial Photo of 14<sup>th</sup> Avenue Landfill , Showing commercial Subdivision, Sacramento CA**



**Figure 5. 14<sup>th</sup> Ave Landfill Boundary**



**Figure 6. Differential Settlement Damage to Structures**



**Figure 7. Structural Gas Monitoring**





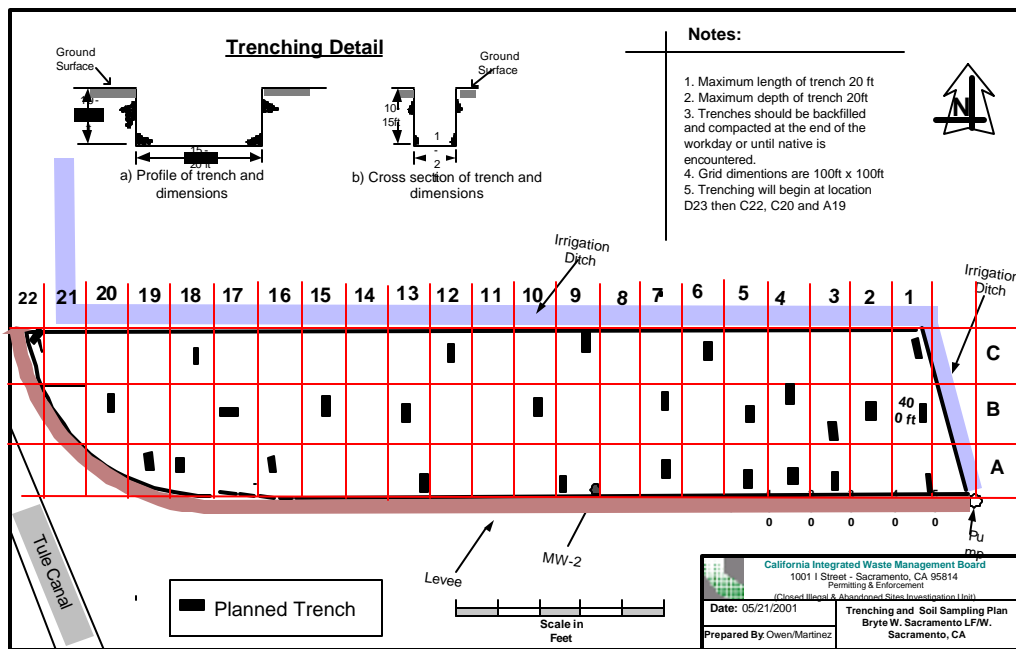
### 3. Cover Standard



**Figure 8. Investigating Cover Thickness At Noah Webster Elementary Burn Site**



**Figure 9. Performing Trenching at Bryte Landfill to determine waste extents and cover thickness**



**Modified Trenching Locations**

**Figure 10. A Trench Location Plan Determines the Horizontal and Vertical Extent of the Disposal Site as Well as Cover Thickness**

#### What would be a Cover in Compliance with State Minimum Standards

- 1) Waste Extents (horizontal and vertical extents) of the site are defined through phase I & II investigation
- 2) Site is 100% Covered, minimum of 2 feet in thickness

- 3) Cover is graded to 3% and compacted (85%)
- 4) Cover has no slopes, e.g. 1/2:1, 1:1, 2:1 that would cause erosion problems (3:1 and 4:1 slopes would be considered OK). For slopes steeper than 3:1, a 15 ft wide bench should be placed for each 50 vertical feet of rise.
- 5) Slope lengths for slopes steeper than 4:1 are no greater than 100 feet.
- 6) Cover is not constructed of highly-erodible materials (soil high in silt content)
- 7) Cover has adequate vegetation to prevent soil loss

**Figure 11. Moffet Field Golf Course Landfill**



**Figure 12. Naval Training Center Landfill**



#### **Factors to consider in issuing a violation**

- ☐ Have the waste extents been adequately defined (horizontal and vertical) through investigation?
- ☐ Is there evidence of exposed waste due to nominal cover, erosion, oversteepened slopes or vandalism
- ☐ If the waste volume is small (less than 10,000 cubic yards), has clean-closure been considered
- ☐ Have waste characteristics been determined through sampling and analysis (are there hazardous levels of lead)?
- ☐ Is there a minimum of two feet of clean soil cover? How was this verified?
- ☐ Is the covered graded and sloped to minimize run-off velocity (and subsequent erosion problems)
- ☐ Is the cover soil erodible (silty-soil)?

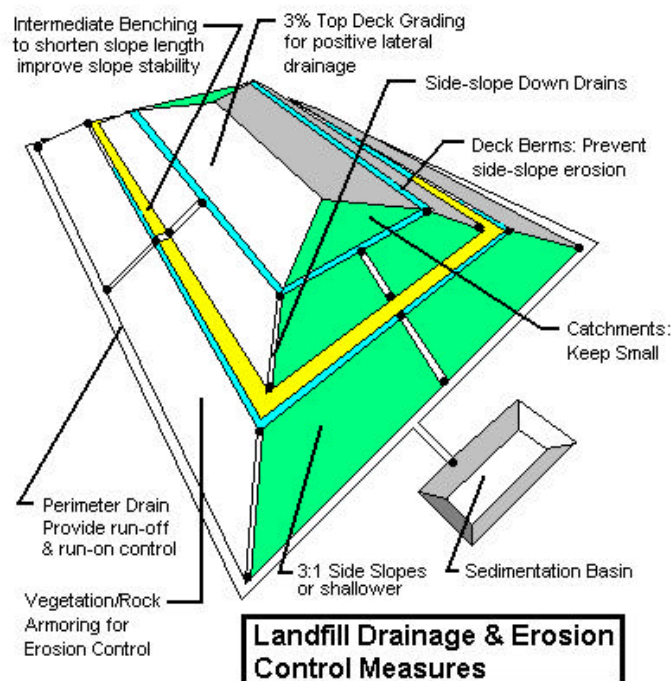


- What type of erosion controls are in place to prevent damage to the cover (drainage controls, grading and slopes, vegetation, erosion-control mats).

## 4. Drainage Standard

**What conditions should be met for Drainage Standards to be in compliance**

- 1) Site was designed and constructed with drainage control system
- 2) Off-site run-on is diverted or managed using drainage channels and conveyances, berms, energy dissipation devices, etc.
- 3) On-site run-off is diverted, slowed, captured using berms, swales, conveyances (trapezoid channels, v-ditches, energy dissipation, rip-rap pads, deck berms, sedimentation basins, etc.)
- 4) Site is graded and sloped to control overland flow quantities and velocities



**Figure 13. Drainage Controls**

**Factors to consider in issuing a drainage violation**

- Significant off-site run-on to manage from local watershed (canyons, hills, confluence areas), i.e. requires diversion. A regional topographic relief map, e.g. 10 mile radius of site, should be reviewed to determine the watershed in which the site resides.

- ❑ Ponded water on flat deck areas (differential settlement could cause)—note that at flat sites grades are difficult to "build-up" and a significant amount of import soil may be required, e.g. a 3% slope requires 3 feet of relief for every 100 horizontal feet.
- ❑ Signs of cover erosion from overland flow, e.g. "erosion rilling"
- ❑ Drainage causing erosion of cover
- ❑ Drainage carrying trash or leachate from landfill to nearby surface water
- ❑ Drainage confluences causing damage to disposal site cover.)



**Figure 14. Ponding on Landfill Surface at the Former San Diego Naval Training Center Landfill**

## **5. Erosion Control Standard**

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**What conditions should be met for a site to Comply with the Erosion Standard?**

- 1) Site has soils with low erodibility (high in clays, sands, gravel, etc.)
- 2) Slopes and grading or drainage control prevents erosion, e.g. short and shallow slope lengths, low-overland flow velocity (non-erosive velocity)
- 3) Lush cover vegetation or erosion control matting (straw crimping or rock armoring)

**Factors to consider in issuing an Erosion Violation**

- ❑ Eroded cover causes waste to be exposed and site drainage not working according to plans (discharge to wrong location--discharge to slopes--confluenced areas causing damage)

- ❑ High overland flow velocity due to grading and slopes
- ❑ Lack of vegetation or highly erodible soils used for cover (soils high in silt content)

**Figure 13. Examples of Erosion Damage.** 1) Slope Erosion Rills at Cold Canyon Landfill due to erodible soil, lack of vegetative cover, control of run-on to slope, 2) Massive slope erosion at the Cactus Road Autoshrredder Disposal Site due to erodible soils, large watershed confluence area, high run-off velocity, oversteepened waste slope, 3) Erosion damage near the Hesperia Landfill due to large drainage confluence area and erodible soils.



## 6. Security Standard

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### What constitutes an Violation of Security?

- 1) Sites in urban areas, with residential encroachment with no adequate personnel, or vehicular access barriers, especially if other standards are in violation (gas, cover, drainage, etc.)-- would not apply if developed with approved PsoCLU, e.g. soccer field, park, etc.)
- 2) Illegal Disposal Activies; nuisance dumping
- 3) Evidence of Vandalism of landfill monitoring and control devices
- 4) Digging or excavation of waste, removal of blue bottles, scavenging activities ("bottle hunting")



- 5) "Legacy" or local history of site indicating illegal dumping, illicit dealings, "meeting place", etc.

**Factors to consider in issuing a Security Violation**

- ❑ Evidence of scavenging or illegal disposal
- ❑ Violation of other State Minimum Standards for Gas, Cover, Drainage & Erosion (cause for potential threat to on-site receptors)
- ❑ Adjacent Land-use (especially proximity to residential)
- ❑ Pedestrian and vehicular access

**Figure 15. Examples of Adjacent Land-Use and Site Access Security Issues. 1&3) Upland Landfill in San Bernardino County, surrounded by residential housing on 3 sides; gas control system highly visible, 2) Duckpond Landfill in National City located in a commercial district (auto dealers); National City Blvd adjacent to site, 4) 38<sup>th</sup> and Quince Burn Site in San Diego, is actually a Lot Parcel in the middle of a residential neighborhood.**

